QUALITY AND RELIABILITY ASSURANCE

HANDBOOK **H 51**

EVALUATION OF A CONTRACTOR'S INSPECTION SYSTEM

3 JANUARY 1967

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
(Installations and Logistics)
Washington, D. C. 20301

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INSTALLATIONS AND LOGISTICS

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H 51

Quality and Reliability Assurance Handbook H 51, developed by a Department of Defense Task Group composed of representatives from the Departments of the Army, Navy and Air Force, and the Defense Supply Agency, is approved for printing and distribution.

This handbook provides guidance for evaluation of contractors' inspection systems established in accordance with MIL-I-45208A, "Inspection System Requirements." The handbook shall not be referenced in purchase specifications nor shall it supersede any specification requirements.

H 51 will be reviewed periodically for completeness and accuracy. Users are encouraged to report errors and recommendations for changes to the Director, Defense Supply Agency, ATTN: DSAH-FQM, Cameron Station, Alexandria, Virginia, 22314.

George E. Fouch

GEORGE E. FOUCH
Deputy Assistant Secretary of Defense
(Equipment Maintenance and Readiness)

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INTRODUCTION

Quality and Reliability Assurance Handbook H-51 provides guidance for the evaluation of a contractor's inspection system when Military Specification MIL-I-45208A, Inspection System Requirements, is invoked in a contract. This handbook is based on Department of Defense quality assurance concepts and policies which state:

a. The prime contractor is responsible for the control of product quality and for offering to the Military Departments for acceptance only those products determined by him to conform to contractual requirements.

b. The Government representative is responsible for determining that contractual requirements have been complied with prior to the acceptance of the product.

c. Final decision of product acceptability is solely the responsibility of the Government representative.

MIL-I-45208A requires the contractor to design and maintain an inspection system that provides for all necessary inspections of the product including, where required, inspections at all stages of the manufacturing process as well as examination and testing of the finished product. As such an inspection system must be tailored to each supplier's plant, process and product. MIL-I-45208A describes the inspection system requirements in terms of objectives rather than detailed operating procedures.

This handbook does not provide detailed procedures and check lists for evaluating an inspection system; however, it does provide guidelines for the development, planning, and execution of a comprehensive evaluation program to assist the Government representative in the selection and application of criteria for evaluating a contractor's system.

The efficient use of this handbook requires a clear understanding of:

(1) The DoD procurement quality assurance function as stated in Sections VII and XIV of the Armed Services Procurement Regulation (ASPR).

(2) MIL-Q-9858A, Quality Program Requirements and its companion document Handbook H-50.

(3) MIL-C-45662A, Calibration System Requirements and its companion document Handbook H-52.

An inspection system conforming to MIL-I-45208A is not intended to correct deficiencies in other contractual documents. The contractor is not obligated to perform beyond the requirements specified in the contract or in MIL-I-45208A.

The format followed throughout this handbook is designed to relate suggested system evaluation criteria as directly as possible to the requirements of MIL-I-45208A. Each subsection of the specification is quoted verbatim and followed by appropriate comments in the following order:

SUBSECTION OF MIL-I-45208A

A. "Review of Requirement"—Discussion of the requirements set forth in the subsection.

B. "Application"—Discussion of typical contractor procedures to comply with requirements.

C. "Criteria for Evaluation"—When appropriate, questions which should be asked to evaluate that particular part of a contractor's inspection system.

Most of the questions contained in the various "Criteria for Evaluation" are quite broad. They are intended to serve only as indicators and reminders of important points to be covered in such depth and detail as is necessary to assure an effective and complete evaluation.

Inspection System Applicability and Compatibility

1. SCOPE

1.1 SCOPE. This specification establishes requirements for contractors' inspection systems. These requirements pertain to the inspections and tests necessary to substantiate product conformance to drawings, specifications, and contract requirements and to all inspections and tests required by the contract. These requirements are in addition to those inspections and tests set forth in applicable specifications and tests set forth in applicable specifications and other contractual documents.

A. Review of Requirement. Military Specification MIL–I–45208A, Inspection System Requirements, specifies the requirements for a contractor's inspection system. These requirements cover each element of the inspection system that a contractor may need to assure that the product complies with all quality requirements.

B. Application. In implementing the inspection system described by MIL–I–45208A, the contractor is required to design, establish, and maintain procedures that meet those requirements of MIL–I–45208A applicable to his facilities and products. The contractor is required to translate these requirements, which are expressed in terms of objectives, into the operating instructions and procedures that collectively comprise the inspection system needed.

C. Criterin For Evaluation. Compliance with this paragraph of MIL–I–45208A does not require evaluation.

1.2 APPLICABILITY

1.2.1 Applicability. This specification shall apply to all supplies or services when referenced in the item specification, contract or order.

A/B. Review and Application For Requirement. MIL–I–45208A is designed for use in contracts for those supplies and services that require only an effective control of examination and testing operations to assure that the product conforms to quality requirements. When MIL–I–45208A is included in a contract, it appears in a standard clause such as the following:

INSPECTION OF SUPPLIES AND CORRECTION OF DEFECTS (MAY 1960)

All supplies (which term throughout this clause includes without limitation raw materials, components, intermediate assemblies, and end products) shall be subject to examination and test by the Government, to the extent practicable at all times and places including the period of manufacture, and in any event prior to acceptance. The contractor shall provide and maintain an inspection system acceptable to the Government covering the supplies, fabricating methods, and special tooling hereunder. The inspection system shall be in accordance with military specification MIL–I–45208A. The Government, through any authorized representative, may inspect the plant or plants of the contractor or of any subcontractors engaged in the performance of this contract.

If any examination or test is made by the Government on the premises of the contractor or a subcontractor, the contractor shall

provide and require subcontractors to provide all reasonable facilities and assistance for the safety and convenience of the Government inspectors in the performance of their duties. All examinations and tests by the Government shall be performed in such a manner as will not unduly delay the work. Except as otherwise provided in this contract, acceptance of any supplies or lots of supplies shall be made as promptly as practicable after delivery thereof and shall be deemed to have been made no later than 60 days after the date of such delivery, if acceptance has not been made earlier within such period.

C. Criteria For Evaluation. Compliance with this paragraph of MIL–I–45208A does not require evaluation.

1.2.2 Relation to Other Contract Requirements. The inspection system requirements set forth in this specification shall be satisfied in addition to all detail requirements contained in the statement of work or in other parts of the contract. The contractor is responsible for compliance with all provisions of the contract and for furnishing specified articles which meet all requirements of the contract. To the extent of any inconsistency between the contract schedule or its general provisions and this specification, the contract schedule and the general provisions shall control.

A. Review of Requirement. The inclusion of MIL–I–45208A in a contract does not change or modify other requirements set forth in the contract. If there is an apparent conflict between the contract and MIL–I–45208A, the contract requirements shall prevail.

B. Application. The contractor is responsible for reviewing the technical requirements of a contract to determine whether or not the contract deletes or modifies any of the requirements of MIL–I–45208A. If there are conflicting requirements, the contractor should comply with the schedule or general provisions of the contract.

C. Criteria For Evaluation. Compliance with this paragraph of MIL–I–45208A does not require evaluation.

1.2.3 Options. This specification contains fewer requirements than specification MIL–Q–9858, Quality Program Requirements. The contractor may use, at his option, the requirements of MIL–Q–9858, in whole or in part, whenever this specification is specified, provided no increase in price or fee is involved. This option permits one uniform system in the event the contractor is already complying with MIL–Q–9858.

A. Review of Requirement. All of the inspection system requirements of MIL–I–45208A can be met by a quality program which conforms to the requirements of MIL–Q–9858A. Accordingly, MIL–I–45208A offers an option to the contractor who established a quality program conforming to MIL–Q–9858A to comply with MIL–Q–9858A in lieu of MIL–I–45208A provided he does not receive additional compensation.

B. Application. The purpose of this option is to permit a contractor who is required to conform to MIL–Q–9858A on one contract, and to MIL–I–45208A on another contract, to use the quality program procedures for both contracts. The contractor's inspection system is assumed to meet the objectives of MIL–I–45208A when the contractor has established a quality program that conforms to MIL–Q–9858A.

C. Criteria for Evaluation.

1. If the contractor has elected to substitute MIL–Q–9858A partially or completely for MIL–I–45208A, is any increase in price or fee involved?

2. If MIL–Q–9858A is only used partially, are all of the remaining contract requirements being met?

2. APPLICABLE DOCUMENTS

2.1 GENERAL. The following documents of the issue in effect on date of invitations for bids form a part of this specification to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL–Q–9858

Quality Program Requirements

MIL–C–45662

Calibration System Requirements

2.2 AMENDMENTS AND REVISIONS. Whenever this specification is amended or revised subsequent to its contractually effective date, the contractor may follow or authorize his subcontractors to follow the amended or revised document provided no increase in price or fee is required. The contractor shall not be required to follow the amended or revised document except as a change in contract. If the contractor elects to follow the amended or revised document, he shall notify the Contracting Officer in writing of this election. When the contractor elects to follow the provisions of an amendment or revision, he must follow them in full.

2.3 ORDERING GOVERNMENT DOCUMENTS. Copies of specifications, standards and drawings required by contractors in connection with specific procurements may be obtained from the procuring agency or as otherwise directed by the Contracting Officer.

Section 2 of MIL–I–45208A is self explanatory and does not require elaboration.

Contractor Controlled Manufacturing Requirements

3. REQUIREMENTS

3.1 CONTRACTOR RESPONSIBILITIES. The contractor shall provide and maintain an inspection system which will assure that all supplies and services submitted to the Government for acceptance conform to contract requirements whether manufactured or processed by the contractor, or procured from subcontractors or vendors. The contractor shall perform or have performed the inspections and tests required to substantiate product conformance to drawing, specifications and contract requirements and shall also perform or have performed all inspections and tests otherwise required by the contract. The contractor's inspection system shall be documented and available for review by the Government representative prior to the initiation of production and throughout the life of the contract. The Government at its option may furnish written notice of the acceptability or nonacceptability of the inspection system. The contractor shall notify the Government representative in writing of any change to his inspection system. The inspection system shall be subject to disapproval if changes thereto would result in nonconforming product.

A. Review of Requirement. The contractor is required to:

1. Establish and maintain a system which assures that all supplies and services offered for acceptance are subjected to all of the examinations and tests needed to assure conformance to contract requirements.

2. Provide for the inspection of both those supplies and services produced at his own plant and those purchased from subcontractors or vendors. He may elect to perform the required inspections himself or arrange for someone else to perform the inspections.

3. Document his inspection system to the extent necessary to assure satisfactory operation.

4. Permit the Government representative to review the inspection system at any time during the life of the contract.

5. Notify the Government representative in writing when any changes are made to the inspection system. All or any part of a contractor's inspection system may be disapproved by the Government when the system does not accomplish its objectives.

B. Application. An acceptable inspection system requires comprehensive procedures, documented in writing where necessary, that provide for standard approaches to the various types of inspection activity in a contractor's plant.

To meet the objective of this requirement, the contractor must develop a systematic approach to inspection which assures that the product which passes inspection conforms to technical requirements.

Whether or not a contractor delegates any inspection operations to the suppliers, he alone is responsible to the Government for the quality of the suppliers' products. In fulfilling this responsibility, the contractor must decide what inspection system requirements are applicable to the suppliers, which inspections are to be performed in his own plant, and whether or not he needs the inspection services of a commercial laboratory.

To meet the objective of this requirement

the contractor must be able to demonstrate the required inspections are being performed satisfactorily. The Government representative must be permitted to review any part of the inspection system at any time throughout the life of the contract. He must be notified in writing when there are changes to any part of the inspection system. The objective of this requirement is to establish the Government's right to evaluate and disapprove the contractor's inspection system when the system fails to meet the objectives set forth in MIL–I–45208A.

C. Criteria For Evaluation.

1. Does the inspection system cover all supplies and services offered to the Government for acceptance?

2. Does the inspection system cover all supplies and services procured from subcontractors or vendors?

3. Does the inspection system assure that all supplies and services submitted to the Government for acceptance conform to contract requirements?

4. Is the inspection system documented including specific inspection procedures?

5. Are all contractor and supplier tests and inspections documented?

6. Is all documentation available to the Government representatives for review?

7. Does the contractor notify the Government in writing of all changes to the system?

8. Does the contractor comply with all Government decisions concerning changes?

3.2 DOCUMENTATION, RECORDS AND CORRECTIVE ACTION.

3.2.1 Inspection and Testing Documentation. Inspection and testing shall be prescribed by clear, complete and current instructions. The instructions shall assure inspection and test of materials, work in process and completed articles as required by the item specification and the contract. In addition, criteria for approval and rejection of product shall be included.

A. Review of Requirement. MIL–I–45208A requires the contractor to prepare and use clear, complete, and up-to-date instructions for all examination and testing activities required under the terms of the contract. The instructions must assure that all of the examinations and tests required by contract or specifications are accomplished on materials, work in process and completed articles. The test and examination instructions also must provide complete approval and rejection criteria for all products.

B. Application. Detailed testing and examination instructions may appear in a variety of documents. Many inspection instructions, for example, appear in the form of dimensions, tolerances and notes on the contractor's drawing. Others appear as line entries on a variety of work instructions such as job tickets, production control sheets, and routing tickets. Documented examination and testing instructions are also located in laboratories and testing departments to cover their specific activities.

There also may be supplemental examination and testing instructions with specific criteria for judging product acceptability. For instance, a written inspection instruction may be accompanied by a sample, a photograph, an optical chart or surface finish block to serve as a visual comparison standard. It may also include standard references, such as tables, charts or books.

To meet the objective of the requirements in this paragraph, the contractor's inspection instructions may either be oriented along product lines or along functional lines (e.g., receiving, in-process, final inspection). Either method or a combination of both is acceptable, including the variations described, provided the instructions assure the performance of the inspections needed to prove compliance with the contractual and specification requirements.

C. Criteria For Evaluation.

1. Are all inspection instructions clear, complete, and up-to-date?

2. Are all required instructions available and current?

3. Are there instructions for the examination and testing of raw materials, work in-process, and completed items as required by the item specification and other contract requirements?

4. Do the instructions provide criteria for approval or rejection of products?

> **3.2.2 Records.** The contractor shall maintain adequate records of all inspections and tests. The records shall indicate the nature and number of observations made, the number and type of deficiencies found, the quantities approved and rejected and the nature of corrective action taken as appropriate.

A. Review of Requirement. The contractor is responsible for testing and examining his products and for providing objective evidence that these tests and inspections have, in fact, been performed.

The importance of proper record keeping for contractor inspection systems cannot be overemphasized. Thus, MIL–I–45208A requires adequate records covering all examinations and tests.

As a minimum, examination and test records must indicate the number and types of deficiencies found, the actions taken concerning them, and the nature and number of observations made. In addition, these records must indicate the quantities of acceptable and rejected items.

B. Application. To meet the objective of this requirement, the contractor may design the inspection records in any suitable format. He may use records that show actual inspection results, data, or statements of quality that can be used as evidence that the product meets contract requirements. Records are considered one of the principal aspects of objective evidence in quality.

C. Criteria For Evaluation.

1. Does the contractor maintain adequate records of all examinations and tests?

2. Do the records indicate the nature and number of observations made?

3. Do the records indicate the number of items that passed and did not pass inspection?

4. Do the records indicate the number and types of deficiencies found?

5. Do the records indicate the corrective action taken?

> **3.2.3 Corrective Action.** The contractor shall take prompt action to correct assignable conditions which have resulted or could result in the submission to the Government of supplies and services which do not conform to (1) the quality assurance provisions of the item specification, (2) inspections and tests required by the contract, and (3) other inspections and tests required to substantiate product conformance.

A. Review of Requirement. The contractor is required to correct promptly any assignable inadequacies in his inspection system which have resulted or could result in nonconforming products or services being offered to the Government for acceptance.

B. Application. Whether or not action to correct an inadequacy in an inspection system can be taken as promptly as desired, the contractor is responsible for assuring that defective products are not submitted to the Government for acceptance. If the inadequacy cannot be corrected immediately, the contractor is required to take appropriate interim measures to assure the quality of the product, such as the use of more stringent and thorough inspection of the product. He may, for example, substitute 100% screening for a sampling inspection procedure, may test the product for all rather than selected quality characteristics, or install a sorting operation in the production process.

To meet the objective of the requirements in this paragraph, the contractor's inspection system must provide for both the detection of potential as well as actual causes of defects and the elimination, as soon as practical, of those causes that are detected.

C. Criteria For Evaluation.

1. Is action taken promptly to correct all conditions which cause defects to be submitted for Government acceptance?

___ 2. Are the causes of potential defects identified and corrected?

3. Is corrective action directed at deficiencies in meeting item specification requirements, contract requirements, all other inspection and testing requirements necessary to substantiate product quality?

3.2.4 Drawings and Changes. The contractor's inspection system shall provide for procedures which will assure that the latest applicable drawings, specifications and instructions required by the contract, as well as authorized changes thereto, are used for fabrication, inspection and testing.

A. Review of Requirement. The contractor is required to establish procedures capable of assuring that the latest drawings, specifications and other instructions, including the latest changes thereto, are used to manufacture, examine and test the product.

B. Application. It is essential that the documentation used to manufacture and inspect a product be complete, current, and correct throughout the life of a contract. For this reason drawings, specifications, and contract instructions require continuing surveillance to assure their accuracy and currency.

When the contractors are required to prepare technical documentation they must have procedures to assure validity of content and conformance to format. The contractor must provide procedures to cover not only the preparation and handling of change proposals but also the incorporation of approved changes into applicable technical documentation.

To meet the objectives of paragraph 3.2.4, the contractor's inspection system must provide sufficient control over the preparation, storage, and issuance of drawings, specifications, and other instructions (used to manufacture and inspect the product) to assure that these documents, and only these documents, are used for fabrication and inspection. These documents are found throughout an organization (e.g., engineering, production control, testing, assembly lines, purchasing.) Therefore the inspection system should provide procedures that assure the immediate recall and replacement of obsolete documents at all points of use. The inspection system may include any method or procedure provided it assures the use of current, complete, technical documentation, including approved changes, for both the manufacture and inspection of the product.

C. Criteria For Evaluation.

1. Does the contractor's inspection system provide procedures which assure that only the latest applicable drawings, specifications, and instructions, including all approved changes, are used for fabrication, examination and testing?

2. Is the latest revised drawing being used in all manufacturing areas and test and examination points?

3.3 MEASURING AND TEST EQUIPMENT. The contractor shall provide and maintain gauges and other measuring and testing devices necessary to assure that supplies conform to the technical requirements. In order to assure continued accuracy, these devices shall be calibrated at established intervals against certified standards which have known valid relationships to national standards. If production tooling, such as jigs, fixtures, templates, and patterns is used as a media of inspection, such devices shall also be proved for accuracy at established intervals. Calibration of inspection equipment shall be in accordance with MIL–C–45662. When required, the contractor's measuring and testing equipment shall be made available for use by the Government representative to determine conformance of product with contract requirements. In addition, if conditions warrant, contractor's personnel shall be made available for operation of such devices and for verification of their accuracy and condition.

A. Review of Requirement. The contractor is required to provide gauges, measuring, and testing devices that have valid relationship to National Standards and accurate enough to perform all examinations and tests applicable to the product. He is required to provide for the systematic inspection and calibration of these gauges, measuring and test devices as specified in MIL–C–45662A.

The contractor is also required to provide any gauges, measuring and testing devices, as well as the personnel to operate this equipment and to verify its accuracy, that the Government representative may require in the performance of any examination considered necessary.

Meters, gauges and other measuring and test devices which can assess the quality, performance, dimensions and other technical requirements of products are an essential element of the inspection system specified by MIL–I–45208A. These devices must be inspected and calibrated on a regularly scheduled basis to prevent inaccuracies or at least to detect them as early as possible. Defective devices must be repaired, replaced, or recalibrated as appropriate.

In the event contractors elect to use production tooling for inspection and gauging, special precautions must be taken to assure accuracy. This involves both proof of accuracy before release for use as well as checking at a regular, formally established interval thereafter to prevent inaccuracy.

MIL–I–45208A requires compliance with the inspection and calibration practices covering measuring and testing equipment as prescribed in detail in specification MIL—C—45662A.

It frequently is desirable for Government and contractor personnel to jointly use contractor inspection equipment. The contractor therefore shall permit the Government to use such equipment or to witness contractor use of this equipment to verify inspection accuracy and product quality. However, if required, the contractor must supply personnel for operating and verifying the accuracy of inspection equipment being used for Government test or examination of product conformance.

B. Application. Contractors must recognize the necessity for carefully and continually checking test and examination equipment to assure that the necessary degree of accuracy is being maintained. A comprehensive calibration system, such as that required by MIL–C–45662A, is necessary. The system must assure the direct or indirect traceability of contractor calibration standards through an unbroken chain of calibrations to the National Reference Standards. The frequency of calibration is determined on the basis of the type, purpose, usage rate, and degree of accuracy and other appropriate factors of the equipment involved. Contractor and Government personnel may obtain additional information about specification MIL–C–45662A in handbook MIL–HDBK–52.

Gauge identification is also extremely important. In addition to numbering every gauge, color codes, labels and the like are frequently employed to give a visual indication of the date that the accuracy of the gauge was last verified. To effectively control this equipment, contractors should establish such things as gauge-wear policies and keep accurate records on each piece of equipment. Obsolete or inaccurate equipment should be carefully segregated or discarded to prevent its use. When employee-owned testing and measuring equipment is used, it should be serviced by the contractor's calibration system to assess and maintain its accuracy. In the event contractors also find it desirable or necessary to use production tooling for inspection gauging, extra care must be exercised to assure the continued accuracy of the production tooling.

It should be noted that some equipment used for special manufacturing operations contains automatic gauging controls which are also considered a part of a contractor's inspection and testing system. Their use or the use of production tooling for inspection and gauging is acceptable if carefully controlled and monitored to assure continued accuracy. The Government does not normally provide its inspectors in the field with gauges, measuring and testing devices. The more complex test equipment is so expensive and often re-

quires such special facilities that it would be highly uneconomical for the Government to provide them at all contractors' plants. Therefore, contractors make available to the Government their testing and measuring equipment. Sometimes the contractor's special testing and measuring equipment may warrant the use of contractor personnel to operate these devices for Government inspection.

In some instances the use of contractor testing and measuring equipment by Government personnel may prove to be a "bottle neck" to production operations. Therefore, most contractors plan for the Government's use of their equipment and provide sufficient time and equipment so that Government use in addition to their own use does not delay production. Many contractors find it to their own benefit to protect the operability of their complex and specialized equipment by making their personnel available to operate this equipment for the Government representative. However, in some cases the manner of operating this testing equipment gives false results. Under such conditions the Government representative desires to operate the testing equipment himself. Some firms provide instructions for Government representatives to operate their specialized testing and measuring equipment.

Contractors rightfully expect Government representatives to avoid unnecessary delays in production due to Government procurement quality assurance actions. In furtherance of this, Government representatives frequently will witness company inspections and thus contractor and Government procurement quality assurance actions are accomplished together. However, this is not required and often is not practical or desirable. The efficiency and effectiveness with which Government manpower resources are employed at a contractor's plant sometimes requires that the Government conduct its procurement assurance action independently.

C. Criteria For Evaluation.

1. Are the gauges, testing and measuring equipment which are necessary to assure that products meet technical requirements available and, are procedures established for their use?

2. Is the test and measuring equipment properly maintained?

3. Are these devices calibrated on a regular basis to assure that they are of the required accuracy?

4. Is there continuous control of these devices to prevent their use when they become inaccurate, and to correct, repair or replace them?

5. Are the required certified measurement standards available and used?

6. Are these certified standards traceable to National Standards?

7. Is all tooling which is used as inspection equipment proved for accuracy prior to use?

8. Is such tooling re-inspected at intervals established in a manner which assures the adjustment, replacement or repair of the tooling before it becomes inaccurate?

9. Does the contractor comply with MIL–C–45662A, Calibration System Requirements?

10. Does the contractor make his inspection equipment and facilities available to the Government representative for verification of the contractor's results where required?

11. Does the contractor provide personnel to perform this inspection, if warranted?

3.4 PROCESS CONTROLS.

Process control procedures shall be an integral part of the inspection system when such inspections are a part of the specification or the contract.

A. Review of Requirement. The detailed requirements pertaining to the controls for some manufacturing processes, such as welding, plating or radiography appear in Federal or military specifications. Process control requirements also may be set forth in the contract or its references. However specified, the contractor is required to incorporate these process controls into the inspection system.

B. Application. Every manufacturing operation affects product quality and, therefore,

requires some kind of quality assurance action. The required action, however, may not necessarily involve an examination or test of the product. The quality of a welded or heat-treated part, for example, may be impossible to determine without destroying the part. In such cases the quality assurance requirements include some form of process control to be applied when performing the work. To meet the objective of requirements in this paragraph, the contractor must identify and integrate into the inspection system all process controls applicable to his product.

In compliance with paragraph 3.4, contractors make all operations or process control procedures a part of the inspection system when such procedures are cited in the contract or referenced specifications. These operations are then controlled and inspected to all of the applicable requirements of MIL–I–45208A.

C. Criteria For Evaluation.

1. Are there contract or specification requirements for control of any specific manufacturing processes or operations?

2. Are such specified control procedures an integral part of the inspection system?

3.5 INDICATION OF INSPECTION STATUS. The contractor shall maintain a positive system for identifying the inspection status of supplies. Identification may be accomplished by means of stamps, tags, routing cards, move tickets, tote box cards or other control devices. Such controls shall be of a design distinctly different from Government inspection identification.

A. Review of Requirement. The contractor is required to be able at all times to identify which units or lots have (1) not yet been inspected, (2) been inspected and approved, or (3) been inspected and rejected. Identifying the status of these conditions can be accomplished in a variety of ways. In the absence of a contractual requirement, MIL–I–45208A permits contractors to select any method for indicating inspection status, provided only that it cannot be mistaken for Government identification.

B. Application. Manufacturers engaged in commercial production normally maintain some system for positive identification of inspection status. When such manufacturers become Government contractors, it is not necessary to change the method of identifying inspection status unless it can be mistaken for that of the Government.

Contractors may prefer inspection stamps in lieu of other identification methods. Contractors find serially numbered stamps assigned on an individual basis useful in achieving better quality control since they identify each inspector's work. Other suppliers do not. The DoD no longer makes general use of numbered stamps for inspection purposes. Whatever system is used, stamps, tags, punched cards, etc., the system should provide positive identification of inspection status in such areas as completion of work operations or processes, requirements for special handling, stage of heat treatment, Material Review Board status, etc. The chief reason contractors use inspection stamps is to aid in keeping conforming and nonconforming, inspected and uninspected products properly segregated.

C. Criteria For Evaluation.

1. Does the contractor have an effective system for identifying the inspection status of products?

2. Is the contractor's inspection status identification distinctly different from that of the Government?

Government Controlled Manufacturing Requirements

3.6 GOVERNMENT-FURNISHED MATERIAL. When material is furnished by the Government, the contractor's procedures shall include as a minimum the following:

(a) Examination upon receipt, consistent with practicability, to detect damage in transit.

(b) Inspection for completeness and proper type.

(c) Periodic inspection and precautions to assure adequate storage conditions and to guard against damage from handling and deterioration during storage.

(d) Functional testing, either prior to or after installation, or both, as required by contract to determine satisfactory operation.

(e) Identification and protection from improper use or disposition.

(f) Verification of quantity.

3.6.1 Damaged Government-furnished Material. The contractor shall report to the Government representative any Government-furnished material found damaged, malfunctioning or otherwise unsuitable for use. In the event of damage or malfunction during or after installation, the contractor shall determine and record probable cause and necessity for withholding material from use.

A/B. Review and Application of Requirement. Government Furnished Material (GFM) is material owned by the Government and furnished to contractors for incorporation into the product to be furnished to the Government under the terms of the contract. This material is usually similar in nature to the material contractors obtain from subcontractors in that it will be incorporated into products to be delivered to the Government by the contractor. GFM normally does not require extensive receiving inspection; however, to avoid using or installing any GFM which is defective because of shipping damage, storage, or other reasons, contractors are required to maintain suitable control over GFM. This control normally will include:

a. Examination of GFM upon receipt to detect any shipping damage. This examination frequently may be limited to visual inspection, and disassembly or testing may be neither required nor desirable.

b. Inspection to make certain of proper identification, completeness, and quantity.

c. Periodic inspection during storage to detect any signs of deterioration, guard against damage from mishandling, assure compliance with reinspection requirements and shelf life limitations, and to assure maintenance of proper storage conditions.

d. Functional testing by qualified personnel before or after installation, or both, as required by the contract and applicable specifications.

e. Appropriate identification and safeguarding of the GFM to prevent improper disposal or unwarranted use.

f. The prompt reporting of all unsuitable GFM to the authorized Government representative. If unsuitability is found during or after installation, the contractor should determine the probable cause and determine if it is necessary to avoid use of the material.

C. Criteria For Evaluation.

1. Does the contractor examine GFM upon receipt for damage, quantity, completeness and type?

2. Are there precautions and periodic inspections performed during storage to ascertain damage, deterioration, and mishandling?

3. Is functional testing performed before or after installation, or both, as required by the specification or contract, and does it determine if the material is satisfactory?

4. Is all GFM properly identified and protected from unauthorized use or disposition?

5. Does the contractor record and report to the Government any damage, malfunction, or deterioration of GFM prior to, during, and after installation?

6. When damaged, malfunctioning or unsuitable material is detected by the contractor, is the probable cause determined and recorded by the contractor and is notification provided to the Government representative?

3.7 NONCONFORMING MATERIAL. The contractor shall establish and maintain an effective and positive system for controlling nonconforming material, including procedures for the identification, segregation, presentation and disposition of reworked or repaired supplies. Repair of nonconforming supplies shall be in accordance with documented procedures acceptable to the Government. The acceptance of nonconforming supplies is the prerogative of and shall be as prescribed by the Government. All nonconforming supplies shall be positively identified to prevent use, shipment and intermingling with conforming supplies. Holding areas, mutually agreeable to the contractor and the Government representative, shall be provided by the contractor.

A. Review of Requirement. An effective and positive system must be developed by contractors to assure the control of material produced which is not in compliance with contract requirements. The system must be one that will assure the identification, segregation, and disposition of reworked or repaired supplies. Procedures to prevent the delivery of nonconforming supplies to the Government are essential and must be established by the contractor. Effective segregation and disposal requires proper identification of the defective products at all times.

If nonconforming items are accepted by the Government, it must be done under controlled and prescribed conditions in accordance with the terms of the contract.

If the degree of nonconformance is significant, the receipt of a Formal Waiver or Contract Change Notice from the Procurement Contracting Office is necessary before the material can be accepted. In any situation involving Government acceptance of nonconforming material, the contractor shall follow the procedures prescribed or agreed to by the Government. A price reduction may be required to compensate for the Government's acceptance of items which do not conform completely to applicable specifications or other contract requirements.

B. Application. When seeking Government acceptance of nonconforming material, a contractor must furnish the Government with all pertinent information about the material and its nonconformance so that the Government can render a decision on his request and determine if a price reduction is warranted. Repetitive acceptance of nonconforming material shall not set a precedent for presentation of recurrent nonconforming product. Contractors must keep complete and accurate records of nonconforming supplies offered for acceptance. Government representatives responsible for accepting such supplies should insist on complete records. The exact nature and extent of each deficiency, as well as any repair or rework, must be recorded. These records should be used extensively by contractor and Government personnel responsible for determining

whether nonconforming products meet contractual and other applicable requirements to a sufficient degree to warrant possible acceptance and to assure that corrective action is being taken to prevent the future production of nonconforming supplies.

For repair or rework of nonconforming supplies, contractors are required to prepare all necessary work instructions, procedures, and drawings which must be documented to the Government representative's satisfaction. Welding of a defective casting is an example of a repair requiring appropriate documentation.

When a contract requires the establishment and maintenance of a Material Review Board for decisions regarding disposal of nonconforming supplies, the composition of the Board and required procedures are prescribed by the Government. When not contractually required, contractors may use a material review board of their own choosing subject only to the requirement that the procedures be documented.

C. Criteria For Evaluation.

1. Does the contractor have an effective system for controlling nonconforming material?

2. Does the contractor have documented procedures to properly identify, segregate and dispose of nonconforming material and are these procedures adequate?

3. Does the contractor have documented procedures for repair and rework of nonconforming material and are these procedures adequate?

4. Do repair and rework activities comply with documented procedures? Are they acceptable to the Government?

5. Are holding areas adequate for the segregation and temporary storage of nonconforming material?

3.8 QUALIFIED PRODUCTS. The inclusion of a product on the Qualified Products List only signifies that at one time the manufacturer made a product which met specification requirements. It does not relieve the contractor of his responsibility for furnishing supplies that meet all specification requirements or for performing specified inspections and tests for such material.

A/B. Review and Application of Requirement. **The contractor is required to provide any inspection, when necessary, to assure the quality of a product regardless of whether the product is listed on a Qualified Product List. The fact that a supply item is included on a Qualified Product List (QPL) does not guarantee that the item meets stated requirements. It only indicates that at one time a specific item met all specified requirements. In order to meet the objectives of the requirements in this paragraph, the contractor must make the same arrangements for the inspection of QPL items as for other supplies.**

C. Criteria For Evaluation.

Does the contractor provide for a complete and effective inspection of all products on the Qualified Products List?

3.9 SAMPLING INSPECTION. Sampling inspection procedures used by the contractor to determine quality conformance of supplies shall be as stated in the contract or shall be subject to approval by the Government.

A. Review of Requirement. A contract may or may not require the contractor to utilize a specific sampling plan. As a minimum, the contractor must comply with sampling requirements stated in the contract or specification. In the event the contract permits the contractor to sample, and does not specify a specific sampling method, MIL–I–45208A allows the contractor to select a plan, subject to approval by the Government representative.

B. Application. Two of the most frequently used types of sampling plans are "attributes sampling" and "variables sampling." Attributes sampling is used to inspect items on a good no good basis; how good or how bad is not determined. An example of this type of sampling is the use of "go" and "no go" gauges. Variables sampling determines how good or bad an item is by making and ana-

lyzing actual measurements. With variables sampling, fewer observations are necessary for a given degree of assurance.

Sampling plans commensurate with the prescribe quality level and related risks are contained in DoD Handbooks, Standards and other documents. Sometimes, however, contractors find it advantageous to design their own sampling plans. A qualified mathematician or statigtician should develop such plans to assure that they are effective. Contractors often find it difficult to implement sampling in accordance with all requirements. Sometimes supposed shortcuts are used through misapplication or a false sense of economy.

It is important to note that sampling not in conformance with the established plan is invalid and may be more dangerous than cursory sampling inspection because it may indicate a level of product quality which does not exist in fact. The Government must be assured that sampling procedures are valid and effective; therefore, MIL–I–45208A permit Government review and approval of any contractor-designed sampling procedures used on Government contracts.

C. Criteria For Evaluation.

1. Do required sampling procedures conform with the applicable specification or other procurement documents?

2. Are contractor-designed sampling plans available for review and approval by the Government?

3.10 INSPECTION PROVISIONS. Alternative inspection procedures and inspection equipment may be used by the contractor when such procedures and equipment provide, as a minimum, the quality assurance required in the contractual documents. Prior to applying such alternative inspection procedures and inspection equipment, the contractor shall describe them in a written proposal and shall demonstrate for the approval of the Government representative that their effectiveness is equal to or better than the contractual quality assurance procedure. In cases of dispute as to whether certain procedures of the contractor's inspection system provide equal assurance, the procedures of this specification, the item specification and other contractual documents shall apply.

A. Review of Requirement. When this paragraph is applicable, the contractor is permitted the option either to perform inspection as set forth in applicable product specifications, drawings, and contract instructions, or to use any other inspection procedures and equipment that assure an equivalent level of quality. In the event the contractor chooses to utilize optional procedures and equipment, they must be described in written proposal and satisfactorily demonstrated to the Government representative as being equal to or better than the procedures required by contract. If a dispute arises concerning the effectiveness of the alternate procedures, the contract procedures, the procedures of MIL–I–45208A, and the procedures of the item specification shall be used.

B. Application. In analyzing detailed test and inspection requirements, contractors may find it technically desirable or more economical to use procedures and equipment other than those contractually specified. For example, a contractor-designed sampling plan may be in use or readily available which fits existing test conditions better than the plan cited in the contract. A contractor may desire to use the Scleroscope or the Brinnell method, rather than a required Rockwell test for determining hardness. Use of an optical pyrometer instead of a high temperature thermocouple is another example of possible desirable alternatives. Contractors must, however, prepare a detailed analysis which proves the equivalence or superiority of a proposed alternative.

The contractor must also actually demonstrate the alternative plan's suitability to the satisfaction of the Government representative. For example, a complete set of references and data should accompany the proposal for the optical pyrometer alterna-

tive cited above. In addition, the contractor would conduct a comparison test or demonstration of the relative characteristics of the pyrometer and thermocouple for the benefit of Government representative.

Contractors should recognize that the Government may disapprove the use of substitute test procedures or equipment. In that case, the originally stated contractual requirements remain in force and are binding.

C. Criteria For Evaluation.

1. Has the contractor elected to use any inspection equipment or procedures other than those specified or referenced in his contract?

2. Has the contractor submitted written proposals to the Government for each alternative inspection procedure or equipment he desires to use?

3. Has the effectiveness of each proposed alternative been demonstrated to the Government representative?

4. Are the alternative procedures and equipments at least equal to those specified in the contract?

5. Does the contractor continue to use originally required procedures and equipment until receiving approval to use alternatives, or when an alternative has been disapproved?

3.11 GOVERNMENT INSPECTION AT SUBCONTRACTOR OR VENDOR FACILITIES. The Government reserves the right to inspect at source supplies or services not manufactured or performed within the contractor's facility. Government inspection shall not constitute acceptance; nor shall it in any way replace contractor inspection or otherwise relieve the contractor of his responsibility to furnish an acceptable end item. When inspection at subcontractors' plants is performed by the Government, such inspection shall not be used by contractors as evidence of effective inspection by such subcontractors. The purpose of this inspection is to assist the Government representative at the contractor's facility to determine the conformance of supplies or services with contract requirements. Such inspection can only be requested by or under authorization of the Government representative.

3.11.1 Government Inspection Requirements. When Government inspection is required, the contractor shall add to his purchasing document the following statement:

> "Government inspection is required prior to shipment from your plant. Upon receipt of this order, promptly notify the Government representative who normally services your plant so that appropriate planning for Government inspection can be accomplished."

3.11.2 Purchasing Documents. When, under authorization of the Government representative, copies of the purchasing document are to be furnished directly by the subcontractor or vendor to the Government representative at his facility rather than through Government channels, the contractor shall add to his purchasing document a statement substantially as follows:

> "On receipt of this order, promptly furnish a copy to the Government representative who normally services your plant or, if none, to the nearest Army, Navy, Air Force, or Defense Supply Agency inspection office. In the event the representative or office cannot be located, our purchasing agent should be notified immediately."

3.11.3 Referenced Data. All documents and referenced data for purchases applying to a Government contract shall be available for review by the Government representative to determine compliance with the requirements for the control of such purchases. Copies of purchasing documents required for Government inspection purposes shall be furnished in accordance with the instructions of the Government representative.

A. Review of Requirement. A prime contractor is solely and exclusively responsible for the quality of all material he delivers to the Government regardless of the source of the product. Although the Government may conduct procurement quality assurance actions at his suppliers' plants, the prime contractor's responsibility remains unchanged. Such actions by the Government representative are performed solely for the Government's benefits, and the results may not be used by the contractor as evidence of the quality of the supplies or services. The sole purpose of these procurement quality assurance actions are to provide the Government representative at the prime contractor's plant with assurance that the prime contractor is adequately controlling the quality of supplies and services received from subcontractors. Government actions at the subcontractor's plant can be performed only when requested or authorized by the Government representative.

B. Application. Contractors who obtain materials from subcontractors must establish effective controls to assure the quality of these supplies. Such controls may be either in the contractor's plant or in the subcontractor's plant. In either event the contractor is equally responsible for the quality of the supplies and must be able to provide to the Government representative objective evidence which will demonstrate the quality of the supplies. The Government representative may decide that independent verification of this objective data is desirable and may elect to have the data validated at the subcontractor's plant. This decision may be made in accordance with contract requirements or may be determined to be necessary as a result of the technical requirements of the contracts. The Government procurement quality assurance actions to be performed should be described in specifics and should be limited to the amount necessary to assure the contractor has adequate controls. The contractor must continue his inspection controls independently of these actions and must not use data obtained by the Government as evidence of the effectiveness of his controls. The determination of the necessity for Government procurement quality assurance actions in subcontractor's plants should be determined only by the cognizant Government representative. When it is determined that Government procurement quality assurance actions are necessary in a subcontractor's plant, the contractor shall add to purchasing documents the statements contained in paragraph 3.11.1, MIL–I–45208A. The Government representative shall determine what reference data is necessary for the Government representative at the subcontractor's plant and shall assure that they are made available as required in paragraph 3.11.3, MIL–I–45208A.

The Government representative may elect to furnish copies of the contractor's purchasing documents either through Government channels or through contractor-subcontractor channels. If it is decided to furnish the document through contractor-subcontractor channels, the statement contained in paragraph 3.11.2 must be included in the contractor's purchasing document.

The contractor must make all documents and referenced data applying to Government contracts available to the Government representative. Procedures may be established to provide copies of these documents for Government purposes by mutual agreement between the Government representative and the contractor.

C. Criteria For Evaluation.

1. Do contractor purchasing documents require Government source inspection of supplies only when the Government so requested?

2. Does the contractor use the clauses of paragraph 3.11 of MIL–I–45208A in his purchasing documents when Government procurement quality assurance actions at source are required?

3. Are all documents and referenced data for purchases applying to a Government contract made available to the Government representative for review? When required, are copies furnished in accordance with the Government representative's instructions?

3.12 RECEIVING INSPECTION. Subcontracted or purchased

supplies shall be subjected to inspection after receipt, as necessary, to assure conformance to contract requirements. The contractor shall report to the Government representative any nonconformance found on Government source-inspected supplies and shall require his supplier to coordinate with his Government representative on corrective action.

A. Review of Requirement. The contractor is required to perform such inspection as may be necessary to assure the quality of purchased supplies, including those supplies that have been subjected to Government procurement quality assurance actions at suppliers' plants.

B. Application. The contractor must establish procedures that assure adequate inspection of purchased supplies. Where Government procurement quality assurance action at source is involved, the contractor's procedure must provide for the prompt reporting of defective material to the Government representative at his plant and must require the supplier to coordinate corrective actions with the Government representative at the supplier's plant.

In recognition of the technical limitations of receiving inspections, contractors should make maximum use of supplier quality efforts. Contractors receiving inspection as a practical matter should complement and supplement supplier quality control, rather than ignore or duplicate it unnecessarily. As a result, contractors often may require subcontractors and vendors to maintain quality records such as inspection and test results and also may require the collection of information pertaining to manufacturing inspections and tests—actions which cannot be duplicated later during receiving inspection.

C. Criteria For Evaluation.

1. Is all received material inspected as necessary to assure conformance with contractual requirements?

2. Is the Government representative notified of all defects found in material subjected to Government procurement quality assurance actions at source?

3. Does the contractor require each supplier responsible for defective material subjected to Government procurement quality assurance actions at source to coordinate corrective action with the supplier's own Government representative?

3.13 GOVERNMENT EVALUATION. The contractor's inspection system and supplies generated by the system shall be subject to evaluation and verification inspection by the Government representative to determine its effectiveness in supporting the quality requirements established in the detail specification, drawings and contract and as prescribed herein.

A/B. Review and Application of Requirement. The contractor must permit the Government representative to evaluate and verify the effectiveness of his inspection system and the conformance of supplies to all contractual quality requirements. Such evaluation will detect inadequate provisions or procedures for control of quality and compliance with contract requirements. Full cooperation and assistance from contractors is required and expected.

C. Criteria For Evaluation.

1. Does the contractor permit the Government representative to evaluate his inspection system and the supplies it generates?

2. Does the contractor permit the Government representative to make all necessary verifications and evaluations to determine the inspection system effectiveness in supporting the quality requirements of the detailed specifications, drawings and contract?

Uses In Ordering

4. QUALITY ASSURANCE PROVISIONS

This section is not applicable to this specification.

5. PREPARATION FOR DELIVERY

This section is not applicable to this specification.

6. NOTES

6.1 INTENDED USE. This specification will apply to the procurement of supplies and services specified by the military procurement agencies.

6.2 ORDER DATA. Procurement documents should specify the title, number and date of this specification.

Section 4, 5 and 6 of MIL-I-45208A are self explanatory and do not require elaboration.

(DSA67-0-46/80)